

Claims

[c1] 1. A pneumatic control system for a water cannon that has a barrel for holding a body of water, the barrel having an open end through which a body of water is driven by the application of a fluid-related force and a substantially closed end, the pneumatic control system comprising:

a valve capable of being placed in a primed state in which said first valve is primed to cause a fluid-related force to be applied to a body of water located within a barrel of a water cannon and a fire state in which said first valve causes a fluid-related force to be applied to a body of water located within a barrel of a water cannon;

a pneumatic trigger having a trigger input for receiving a disable/enable signal and having a trigger output for providing a fire signal if said disable/enable signal is in an enable state;

a first pneumatic device having a first input for receiving a firing/priming signal and having a first output for providing a first prime signal if said firing/priming signal is in a firing state;

a second pneumatic device having a second input for receiving a second prime signal and having a second output for providing said disable/enable signal to said pneumatic trigger; and

a third pneumatic device having a gas input for receiving a gas, a third input for receiving said first prime signal, and a fourth input for receiving said fire signal; said third pneumatic device having a third output for providing said second prime signal to said second pneumatic device after said third pneumatic device receives said first prime signal;

said third pneumatic device having a fourth output for providing said firing/priming signal in a firing state to said valve and said first pneumatic device after said third pneumatic device receives said fire signal from said pneumatic trigger, said firing/priming signal in a firing state placing said valve in said fire state;

wherein said third pneumatic device is only capable of being responsive to one of said first prime signal and said fire signal at any point in time.

[c2] 2. A pneumatic control system, as claimed in Claim 1, wherein:

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said valve comprises a 3-way, air actuated valve.

[c3] 3. A pneumatic control system, as claimed in Claim 1, wherein:
said pneumatic trigger comprises a 3-way, manually activated pneumatic valve.

[c4] 4. A pneumatic control system, as claimed in Claim 1, wherein:
said first pneumatic device comprises a pneumatic timer that outputs said first prime signal at predetermined time after receiving said firing/priming signal when said firing/priming signal is in a firing state, wherein said predetermined time is sufficient to expel a body of water from the open end of the barrel of a water cannon.

[c5] 5. A pneumatic control system, as claimed in Claim 1, wherein:
said first pneumatic device comprises a pneumatic timer that outputs said first prime signal at predetermined time after receiving said firing/priming signal when said firing/priming signal is in a firing state, wherein said predetermined time is sufficient to move a piston associated with the water cannon so as to expel a body of water from the open end of the barrel of a water cannon.

[c6] 6. A pneumatic control system, as claimed in Claim 1, wherein:
said first pneumatic device comprises a pneumatic sensor for sensing when a piston associated with the water cannon is at a predetermined position that is indicative of a body of water having been expelled from the open end of the barrel of a water cannon.

[c7] 7. A pneumatic control system, as claimed in Claim 1, wherein:
said first pneumatic device comprises a pneumatic sensor for sensing a level of water that is indicative of a body of water having been expelled from the open end of the barrel of a water cannon.

[c8] 8. A pneumatic control system, as claimed in Claim 1, wherein:
said second pneumatic device comprises a pneumatic timer that outputs said disable/enable signal with an enabled state at predetermined time after receiving said second prime signal, wherein said predetermined time is sufficient to load a body of water into the barrel of a water cannon.

[c9] 9. A pneumatic control system, as claimed in Claim 1, wherein:
said second pneumatic device comprises a pneumatic timer that outputs said disable/enable signal with an enabled state at predetermined time after receiving said second prime signal, wherein said predetermined time is sufficient to reposition a piston associated with the water cannon for another firing of a water cannon.

[c10] 10. A pneumatic control system, as claimed in Claim 1, wherein:
said second pneumatic device comprises a pneumatic sensor for sensing when a piston associated with the water cannon is at a predetermined position that is indicative of a body of water having been loaded into the open end of the barrel of a water cannon.

[c11] 11. A pneumatic control system, as claimed in Claim 1, wherein:
said second pneumatic device comprises a pneumatic sensor for sensing when a piston associated with the water cannon is at a predetermined position that is indicative of a piston associated with the water cannon being sufficiently repositioned for another firing of a water cannon.

[c12] 12. A pneumatic control system, as claimed in Claim 1, wherein:
said third pneumatic device comprises a four-way, double pilot actuated valve.

[c13] 13. A pneumatic control system, as claimed in Claim 1, wherein:
said third pneumatic device having a fifth output for providing a portion of the gas received at said gas input to the barrel of the water cannon to facilitate retraction of a piston associated with the water cannon.

[c14] 14. A pneumatic control system, as claimed in Claim 1, further comprising:
an air filter for receiving a stream of air and outputting a filtered stream of air to said gas input of said third pneumatic device.

[c15] 15. A pneumatic control system, as claimed in Claim 1, further comprising:
pressure indicator located between said pneumatic trigger and said second pneumatic device, said pressure indicator being responsive to said disable/enable signal.

[c16] 16. A pneumatic control system, as claimed in Claim 1, further comprising:
a shot counter located between said first valve and said first pneumatic device,
said shot counter incrementing in response to transitions of said firing/priming
signal.

[c17] 17. A pneumatic control system for a water cannon that has a barrel for holding
a body of water, the barrel having an open end through which a body of water is
driven by the application of a fluid-related force and a substantially closed end,
the pneumatic control system comprising:
first pneumatic control means for producing a pneumatic safety-on signal after
a body of water has been expelled from the open end of the water cannon to
place a pneumatic trigger in a disabled state and producing a pneumatic safety-
off signal after a sufficient amount of water has been loaded into the barrel of
the cannon to place a pneumatic trigger in an enabled state; and
second pneumatic control means, responsive to a pneumatic fire signal from the
pneumatic trigger, for producing a pneumatic firing signal for causing a valve to
allow a fluid related force to be applied to the sufficient amount of water in the
barrel of the water cannon.

[c18] 18. A pneumatic control system, as claimed in Claim 17, further comprising:
a pneumatic trigger for receiving said safety-on signal and said safety-off
signal and producing said pneumatic fire signal ; and
a valve for receiving said pneumatic firing signal.

[c19] 19. A pneumatic control system, as claimed in Claim 17, wherein:
said first pneumatic control means includes a pneumatic timer.

[c20] 20. A pneumatic control system, as claimed in Claim 17, wherein:
said first pneumatic control means includes a first pneumatic timer and a
second pneumatic timer.

[c21] 21. A pneumatic control system, as claimed in Claim 17, wherein:
said first pneumatic control means includes a pneumatic sensor and a
pneumatic gate that is responsive to a signal output by said pneumatic sensor.

[c22] 22. A method for controlling a water cannon that has a barrel for holding a body

of water, an open end through which a body of water is driven by the application of a mechanical force and a substantially closed end, the method comprising:

first providing a valve capable of being placed in a primed state in which said valve is primed to cause a fluid-related force to be applied to a body of water located in the barrel of a water cannon and a fire state in which said valve causes a fluid-related force to be applied to a body of water located in the barrel of the water cannon;

second providing a pneumatic trigger capable of being placed in a disabled state and an enabled state, and when said pneumatic trigger is in said enabled state, capable of producing a pneumatic fire signal;

first producing, after a body of water has been expelled from the open end of the water cannon, a pneumatic safety-on signal to place said valve in said primed state and to place said pneumatic trigger in said disabled state;

second producing, after said step of first producing and after a sufficient amount of water has been loaded into the cannon, a pneumatic safety-off signal to place said pneumatic trigger in said enabled state;

third producing, after said step of second producing and after said pneumatic trigger produces a pneumatic fire signal, a pneumatic firing signal that causes said valve to transition from said primed state to said fire state to allow a fluid-related force to be applied to the sufficient amount of water in the barrel of the water cannon.

[c23] 23. A method, as claimed in Claim 22, wherein:
said step of first producing comprises waiting a predetermined amount of time after said step of third producing that is indicative of the body of water having been expelled from the open end of the water cannon.

[c24] 24. A method, as claimed in Claim 22, wherein:
said step of first producing comprises sensing a position of a piston associated with the water cannon that is indicative of the body of water having been expelled from the open end of the water cannon.

[c25] 25. A method, as claimed in Claim 22, wherein:

said step of first producing comprises sensing a level of water within the water cannon that is indicative of the body of water having been expelled from the open end of the water cannon.

[c26] 26. A method, as claimed in Claim 22, wherein:
said step of second producing comprises waiting a predetermined amount of time after said step of first producing that is indicative of a body of water having been loaded into the barrel of the water cannon.

[c27] 27. A method, as claimed in Claim 22, wherein:
said step of second producing comprises sensing a position of a piston associated with the water cannon that is indicative of the piston being sufficiently repositioned for another firing of the water cannon.

[c28] 28. A method, as claimed in Claim 22, wherein:
said step of second producing comprises sensing a level of water within the barrel of the water cannon that is indicative of a body of water having been loaded into the barrel of the water cannon.